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Conservation  
Service

# Soil & Water Conservation News

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## Small Farm Operators Get Help

Help to small farm operators and their families in improving their quality of life is continuing in 17 pilot small farm assistance projects nationwide.

The projects have been selected to demonstrate the coordinated efforts of the United States Department of Agriculture (USDA), the Community Services Administration (CSA), and ACTION—the parent body of VISTA and the Peace Corps—in solving the problems of small farmers.

Two of the projects are in West Virginia and South Dakota.

### West Virginia

The project in the Upper Pocatalico watershed in Roane County, W. Va.,

is aimed at helping about 500 small farm families control erosion, increase production, and improve housing. The area's major farm enterprise is beef cattle and sheep production.

Federal, State, and county agencies are combining their efforts on the small farm project. USDA agencies are contributing cost-share and technical assistance to farmers in the 76,150-acre area. Cost sharing for the project may exceed a half million dollars. Agencies contributing to the effort are the Agricultural Stabilization and Conservation Service (ASCS), the Soil Conservation Service (SCS), and the Farmers Home Administration (FmHA).

ASCS has provided \$350,000 so far in cost-share funds through the Agricultural Conservation Program. Funding for conservation work on 116 farms has been approved for such

practices as establishing vegetative cover, critical area stabilization, controlling competitive shrubs, fencing, and water conservation practices.

SCS is providing technical assistance to farmers in installing diversions, water impoundment reservoirs, sediment retention measures, erosion control structures, sod waterways, stream protection measures, animal waste control facilities, tree plantings, timber stand improvement, and permanent wildlife habitat.

FmHA is providing funds for low-interest loans to farmers for farm and home improvements.

The State Economic Opportunity Office is providing \$50,000 for home weatherization, and ACTION is providing \$15,000 per year for 5 years for outreach work. The West Central Community Action Association is coordinating these two efforts and

Continued on next page.

## USDA Announces First Project Areas for 1980 Rural Clean Water Program

Secretary of Agriculture Bob Bergland has announced 13 project areas selected under the experimental rural clean water program.

Bergland said an improved environment is the primary objective of the new program. "This means keeping pollutants out of water, preventing fish loss, enhancing the environment and water quality, reducing costs to municipalities for water purification, and providing new and improved recreation areas for water-based sports," he said.

The projects were approved in consultation with the U.S. Environmental Protection Agency (EPA).

"This is a voluntary program," Bergland said. "Any owner or operator of privately owned agricultural land designated as a critical area or source of nonpoint pollution in the approved project areas may participate."

The practices eligible for cost sharing are those that reduce the amount of pollutants entering a stream, lake, or other receiving water. Practices that do more to increase agricultural production than to reduce pollution are not eligible.

Bergland said the projects approved were from applications previously developed and submitted to him under the Clean Water Act of 1977.

The projects will be administered through USDA's Agricultural Stabilization and Conservation Service with

technical assistance coordinated by the Soil Conservation Service and provided by SCS and other USDA agencies. EPA has a continuing role in the implementation and evaluation of the projects. Soil and water conservation districts, State soil and water conservation agencies, and State water quality agencies will help carry out the projects.

The rural clean water projects named by the Secretary are: Lake Tholocco, Ala.; New Castle County, Del.; Rock Creek, Idaho; Highland Silver Lake, Ill.; Prairie Rose Lake, Iowa; Upper Wakarusa, Kans.; Bonne Idee, La.; Double Pipe Creek, Md.; Saline Valley, Mich.; Reelfoot Lake, Tenn.; Snake Creek, Utah; St. Albans Bay, Vt.; and Lower Manitowoc, Wis.

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Small Farm, continued.

also helping farmers with home gardens and emergency energy assistance.

The West Virginia Cooperative Extension Service is publishing a special information newsletter for landowners in the project area. The West Virginia Department of Agriculture has held a workshop on marketing techniques for watershed farmers, and the Forestry Division of the West Virginia Department of Natural Resources is providing technical assistance to landowners in woodland management.

In an article he wrote for the *Spencer Times*, SCS District Conservationist Delmas Carr cited four examples of farmers who have improved their operation through the small farm assistance project: "Thomas Oaks, Sr., whose farm is on Wolf Run, has completed conservation planning for his farm and completed two spring developments; Howard Miller has treated part of his farm with lime and fertilizer on Vineyard Ridge; George Harper, whose farm adjoins the 4-H grounds on Bear Run, has completed several acres of shrub management, opening the area up for better pasture; and Paul Vicars of Gandeeville has completed a farm pond.

"We want the land users to know the capabilities of their land and to manage it accordingly," said Carr. "If we can do this, it will reduce soil erosion and improve the appearance and efficiency of farms at the same time."

West Virginia ASCS State Executive Director and Chairman of the State Rural Development Committee Billy B. Burke said, "The intent of the Upper Pocatalico Small Family Farm Assistance Project, through the combined efforts of the agencies involved, is to improve and protect the

environment while improving the quality of life of the families living in the watershed."

### South Dakota

The small farm assistance project in Charles Mix County, S. Dak., is aimed at helping small farm operators and their families increase their farm management skills.

The county is a rural farming community in the southeastern corner of the State. More than half of its 1,000 farms are small, family operations, and it is the home of most of the State's Yankton Sioux Indian population.

Helping Federal, State, and county agencies involved in the project to be more aware of small farmers' needs are five Charles Mix farmers who volunteer their time and efforts to present small farmers' views to the agencies.

The U.S. Department of Agriculture agencies involved in the 2-year small farm assistance project are SCS, ASCS, FmHA, and the Science and Education Administration-Extension Service (SEA-Extension).

SCS is helping small farmers in the county to develop resource management plans to suit their operation. SCS is encouraging them to participate in long-term conservation planning with financial assistance through the Great Plains Conservation Program.

ASCS has allocated \$75,000 for the project through the Agricultural Conservation Program. The special project funds will be used for improving water quality and for needed soil and water conservation measures in the area. Farmers are growing corn, milo, and small grain crops along the Missouri River which runs through the county, so protecting water quality is top priority.

FmHA has targeted funds for low-interest loans to farmers.

SEA-Extension encourages small farmer loan applicants to take its 10-step farm management class. Allen May, assistant county agent, conducts the classes and says that crop and livestock management plans, direct and hidden costs per acre, and other factors of successful farm operation are discussed. So far, about 50 farm couples have signed up for the class.

SCS and SEA-Extension personnel are also making onfarm visits to explain the programs and assistance available to county farmers through the project. Through ACTION, two VISTA volunteers are working on an outreach program.

About 100 small farm operators have applied for loan assistance. Most of the applicants are young adults operating small farms requiring working capital to get their fledgling operations on a sound financial basis. The Charles Mix small farm assistance project's goal is to educate small farm operators in the use of good resource management plans to counterbalance high costs.

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**Robert P. Ferrebee,**  
county office specialist, ASCS, Morgantown,  
W. Va.  
**Joyce Watkins,**  
public information specialist, SCS, Huron, S. Dak.

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## Comments: from the SCS Administrator


### Rangeland Management Documents Issued

We recently distributed to State and field offices several important documents concerning the use, management, and conservation of the rangelands of the United States. One of these was the proceedings of a symposium: *Rangeland Policies for the Future*. In the overview of the symposium, M. Rupert Cutler, assistant secretary of agriculture for natural resources and environment, announced "a conscious effort (on the part of USDA) to address rangeland conservation and management needs on a high priority basis." He also emphasized that "It is high time that we in USDA give range management equal billing with other renewable resource programs . . . by giving it the additional emphasis it needs and deserves."

The Range Policies Symposium set the stage for the second document which we want to bring to your attention: Secretary's Memorandum No. 1999—Statement of Range Policy. The memorandum, for the first time, outlines the broad goals of USDA and explicitly states departmental policy concerning range use and management. The significance of this document will depend on the use we make of it and our efforts to implement the policies and attain the goals outlined.

Finally, we recently distributed the National Association of Conservation District's (NACD) Pasture and Range Improvement Report. The report was the result of a resolution adopted by NACD in 1975—a pledge to join with other interested parties to forge a national commitment to improve the Nation's pasturelands and rangelands. It is a compilation of ideas, concerns, ongoing activities, and recommendations from many sources.

We commend these three documents to you for further study. They deserve your attention and support.



## RCA Update:

### Public Meetings Held

"This is your meeting . . . we are here to listen," said Dr. Ralph McCracken, Associate Administrator of the U.S. Department of Agriculture's Science and Education Administration (SEA) at meetings in Lancaster, Pa., and Raleigh, N.C.

Dr. McCracken's remarks stated the purpose of public meetings held during the last 2 weeks of February at 18 locations around the country. Nearly 1,300 people attended these meetings and had an opportunity to comment about the proposed conservation objectives and alternative approaches to soil and water conservation programs prepared as part of

USDA's 1979-80 RCA efforts.

The Soil and Water Resources Conservation Act of 1977 (RCA) requires public input into the development of USDA's future soil and water conservation programs. These 18 meetings provided the public opportunities to speak directly to representatives of USDA who had been involved in all phases of RCA at the national level. Written testimonies in addition to oral comments were submitted by representatives of many groups and organizations.

Public comments ranged over the entire spectrum of American agricul-

Continued on next page.

# Trout Farming Grows Nationwide

by Billy M. Teels

Commercial fish farmers are growing trout in 37 States, according to an aquaculture survey conducted by the Soil Conservation Service in 1978. The survey indicates that Idaho alone has 85 commercial producers with more than 200,000 feet of trout raceways. Idaho produces an estimated 90 percent of the total U.S. production of farm-raised trout. According to Tim Pilkington, executive director of the United States Trout Farmers, the estimate of 1979 trout production is 33 million pounds of fish for the food industry and 28 million pounds for recreation fishing, second only to catfish in total aquaculture production.

Many farmers and ranchers are increasing their income by raising trout and providing related outdoor recrea-

tion. For some, trout farming is a sideline; for others, it is the main source of income. For both, it requires intensive management. Water temperature, water hardness, and available oxygen affect the capability of a given water source to produce trout. Most U.S. commercial trout farms use raceways that have a reliable, year-round flow of high-quality water from springs, wells, or streams. The volume of water flowing through the raceways determines the number of trout that can be grown each year. A well-managed trout fishery annually produces about 10,000 pounds of fish per cubic foot per second, or 450 gallons per minute, of water flow at 50° to 65° F.

The successful commercial production of trout requires suitable surface features and soil conditions. Generally, excavated raceways or ponds require slopes from 1 to 3 percent and tight soils which will not allow seepage. Sites for concrete raceways must be safe for construction.

The first step in planning a trout farm is assessing the resources to

determine if they are capable of supporting a commercial fish farming operation. SCS provides technical assistance to prospective fish farmers in resource assessment, facility design and layout, water management systems, and other aspects of fish culture.

This past year, there has been a greater expansion of the Idaho trout farming industry than in the previous 10 years. Trout associations and co-operatives have recently formed in western Montana, and southern Appalachia. New technology has expanded trout production to prairie potholes and southern farm ponds where seasonal water conditions have proven suitable for trout. With market value for trout at an alltime high, a strong current demand for the product, and an orderly growth projected for the future, prospects for the U.S. trout industry appear bright.

**Billy Teels,**  
staff biologist, Ecological Sciences and Technology  
Division, SCS, Washington, D.C.

Public Meetings, continued.

ture and use of non-Federal land as perceived by those testifying. Throughout the Nation, the comments had some common themes. Although not everyone testifying was opposed to the soil and water conservation regulation or cross-compliance proposals, the majority of those commenting voiced strong opposition to those two proposed conservation program approaches. Another often-heard comment was "if USDA provides more people and more money, we will do the conservation work."

One of the more startling comments heard was made at the Grand

Island, Nebr., meeting, where a farmer stated that "we are plowing up our conservation practices because we cannot afford them. If USDA wants us to apply conservation, then we must be able to pick up the cost in the marketplace or with low-interest loans."

Many people used these meetings to vent anger and frustration about their perception of American agriculture and to relay personal accounts of problems faced on the farm.

Those who testified represented farm organizations, agri-related business and industry, and environmental and conservation groups.

All comments made at these meetings became part of the official transcript which was forwarded to the USDA RCA Response Analysis Center in Athens, Ga. All comments will be given careful consideration by the RCA Coordinating Committee as USDA strives to develop a recommended soil and water conservation program which will meet the future food, fiber, economic, and environmental needs of the Nation.

**Tom Levermann,**  
member, RCA Public Participation Team, SCS,  
Washington, D.C.



## Bringing Up Trout

Trout farming is the business of producing and selling high-quality trout or trout eggs. The Soil Conservation Service helps landowners develop an operation and management plan for trout fisheries through soil and water conservation districts.

A trout-farming enterprise can consist of one or more of the following four kinds of commercial fish culture:

1. Operating a fish-out pond. Eight-inch and larger trout are stocked in a pond and fished by anglers for a fee. Some operators lease fishing privileges on an annual basis.

2. Rearing fingerlings (small trout) to market-size fish. Fingerlings are grown in raceways until they are about 8 to 14 inches long. Raceways generally are narrow, rectangular structures 80 to 100 feet long with flowing water 2 to 3 feet deep. Production ponds of other shapes have also been successful. One raceway usually spills into another in a series of two or more stairlike structures. The raceways can be excavated waterways or can be built of concrete

or concrete block. Each must have water-controlled structures, preferably of concrete.

Trout in the raceways are raised on a prepared diet of dry pelleted feed. It takes about 2 pounds of food to produce a 1-pound trout in 10 to 14 months at water temperatures of 50° to 70° F. If raised in water colder than 50° F., trout take 2 years or more to reach market size; in water warmer than 70° F., they grow slowly and are more subject to diseases.

3. Producing fingerling-size trout. Eyed eggs are held until hatched in special trays of running water. Several days after hatching, the small fish, or fry, are transferred to rearing ponds or raceways where they grow to fingerling size—1 to 6 inches.

4. Producing eyed eggs. This requires rearing and holding adult trout in special ponds until the spawning season. The eggs are then stripped from the females and fertilized. The eggs are called eyed eggs when the eyes of the embryonic trout become visible—usually within 2 or 3 weeks after fertilization.

## Fish in New Jersey Are in "Hot Water"

People have thought about using heated waste water from power plants for some time. Recently, however, researchers from Trenton State College and Rutgers University have done more than just think about it.

These New Jersey researchers, in coordination with an electric and gas company in Trenton and the National Science Foundation, have developed an aquaculture facility which uses heated waste water from a nearby power plant to extend the growing season of aquatic organisms.

The research was started in 1973. Since that time, experiments have been done on raising shrimp, eel, striped bass, catfish, and rainbow trout.

Soil Conservation Service Biologist Vernon Hicks was called in to assist in the research effort by providing technical expertise on the rearing of catfish. So far, efforts to raise eel, catfish, and trout at a profit have been successful but not shrimp or striped bass.

This New Jersey waste-heat aquaculture facility is the Nation's largest. The research project is an ongoing study, and plans to expand the facility are underway.

**David L. Smart,**  
State biologist, SCS, Somerset, N.J.



Commercial trout production is a growing industry. Raising trout in raceways like these is one of the four methods of fish culture SCS recommends.

## Home for Herons

One of the last places a person would expect to find a great blue heron rookery is in a State that supports about 1,000 people per square mile. But the township of Lafayette in northwestern New Jersey is the site of a great blue heron rookery; the largest of four such rookeries in the State.

Breeding colonies of great blue heron are classified as a "threatened" wildlife species by the New Jersey Division of Fish, Game, and Wildlife. Concerned about protecting the blue heron rookery from nearby residential development, township officials went to the Sussex-Warren Resource Conservation and Development (RC&D) office for help.

Kent Hardmeyer, the Soil Conservation Service RC&D coordinator, helped them establish a local steering committee to work with officials from New Jersey's Green Acres Program; the New Jersey Division of Fish, Game, and Wildlife; the New Jersey Chapter of the National Audubon Society; and the New Jersey Conservation Foundation on protecting the area from encroachment.

The Green Acres Program was established through a bond bill referendum to provide 50-percent cost



Great blue heron, a threatened wildlife species in New Jersey, enjoy the wetland environment at the Lafayette rookery. The rookery is protected from development through the efforts of concerned citizens.

Photo, Tim McCabe, photographer, Information Division, SCS, Washington, D.C.

sharing to townships, cities, municipalities, and other units of government for purchasing and/or developing open spaces and recreation areas. Green Acres and RC&D funds made up most of the \$375,000 needed to purchase the Lafayette rookery tract and adjacent land.

The township's rookery is now home for more than 100 nesting pairs of heron. More than half the 288-acre tract is wetland and the rest is woodland. The heron nest in sycamore trees at the rookery and eat frogs, tadpoles, small fish, snakes, dragonfly larvae, and insects common to the wetland environment. Besides sycamore trees, the tract supports red maple and oak trees.

The heron migrate south in winter; and when they return in spring, the tract abounds with great blue heron and other migratory waterfowl and

wildlife. Red-tailed hawk, mallard, teal, wood duck, and many other species of wildlife nest near the rookery. Many interesting limestone outcrops, including some of New Jersey's few caves, are also within the rookery's boundaries.

The community has kept the area in its natural state, providing no trails or other facilities. Local high school teachers take students to the rookery for nature study. The local chapter of the National Audubon Society takes an annual census of the heron.

In a State where wildlife would seem to be taking a back seat to the developer, it's encouraging to know that there are programs and organizations to help citizens protect important ecological areas.

David L. Smart,  
State biologist, SCS, Somerset, N.J.

## New Jersey Gets Open Space Through Green Acres Program

Through New Jersey's Green Acres Program, \$540 million has been earmarked for 50-percent cost sharing to local and State units of government in the last 20 years for acquiring and developing land for recreation and open space. New Jersey voters first

passed a bond issue allocating money for the program in 1961. Three additional bond issues have been passed since.

Green Acres funds can be matched with funding from Soil Conservation Service-administered programs such as the Resource Conservation and Development (RC&D) program and Public Law 566 Small Watershed Projects. Coordination of these fund-

ing sources can mean the purchase of open space and development of recreation areas at minimal cost to the sponsoring agency.

Facilities installed under the program include trails, swimming pools and beaches, picnic areas, game areas, campsites, and boating docks.

David L. Smart,  
State biologist, SCS, Somerset, N.J.



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## **SCS Works with The Nature Conservancy**

### **New Cooperative Effort**

In September 1979 a Memorandum of Understanding was signed between the Florida Chapter of The Nature Conservancy and the Soil Conservation Service in Florida to work together in developing stewardship plans for lands already acquired by the Conservancy and for those which may be purchased in the future.

Under the agreement, SCS will assist the Conservancy in furthering its goals to identify, protect, and provide for the stewardship of key natural areas. SCS had agreed to furnish soil information and interpretive data on Conservancy preserves; to aid the Conservancy in identifying ecologically significant lands for possible future acquisition; and to provide stewardship plans for Conservancy areas on a priority basis set by SCS.

### **A New Approach**

With assistance from the local soil and water conservation districts, SCS helped prepare the first Stewardship Plan—a detailed conservation plan—for Conservancy property, the Janet Brooks Preserve in west-central Florida.

The plan consisted of inventorying soil, plant, and animal resources; determining the kinds and possible locations of endangered and threatened plants and animals; making soil interpretations; and developing objectives and alternatives for implementation of the plan.

This stewardship plan is unique because its inventory information was based on ecological community models. This approach established clear alternatives and helped the Conservancy develop an effective plan.

### **Ecological Community Models**

The ecological community concept is explained as follows: The plant community on a particular site is determined mostly by soil conditions, if climate and topography are held constant. The species of wildlife on that site vary according to the plant community. This interrelationship forms an ecological community. SCS identified 26 ecological communities in the State of Florida.

The typical ecological community model is organized into the following elements: Occurrence; Description, including Soils, Vegetation and Animals; Land Use Interpretations, including Environmental Value as a Natural System, Rangeland, Wildlife land, Woodland, and Urban land; and a list of Endangered and Threatened Plants and Animals.

The use of ecological communities as a basis for developing a stewardship plan proved to be better than use of conventional methods. In developing a Conservancy stewardship plan, the staff can use indicator species to identify the ecological communities on the site. Inventory information is then readily available on each of these communities, as well as ecological values and limitations and recommendations for use. It is then a matter of setting priorities and developing alternatives for use of the land.

### **The Janet Brooks Preserve**

The SCS staff and a local Conservancy committee developed four objectives in the Janet Brooks Preserve stewardship plan: (1) environmental education designed to demonstrate people's dependence on the natural environment; (2) protecting the preserve from plant and wildlife destruction and soil erosion; (3) encouraging scientific research; and (4) providing

opportunities for recreation in the form of nature studies. The plan includes interpretive maps and community descriptions, hiking and elevated trails, safety fire lanes and periodic burning to maintain the longleaf pine in one community, soil erosion control measures, and visitor use control measures.

The Nature Conservancy is pleased with the results of this new approach and will continue to follow the ecological community concept in future stewardship plans.

The Nature Conservancy is a national, nonprofit conservation organization that has worked to preserve more than a million acres. The Conservancy accomplishes this work through accepting gifts of land, purchasing land, and acquiring land for conservation agencies. About 60 percent of all Conservancy projects remain in Conservancy ownership, and most are managed by volunteers. The remaining areas are transferred to government agencies, universities, or other conservation organizations for protection. The lands held by the Conservancy are open to the public for scientific, educational, and passive recreation use.

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### **Conference on Rural Conservation**

"Rural Conservation: Protecting Our Farms and Villages" (June 13-14, Washington, D.C.) will focus on critical rural conservation and preservation problems that could have significant impact on the future well-being of our Nation.

Sponsored by the National Association of Conservation Districts and the National Trust for Historic Preservation.

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# The Real Dirt About Soils

by Lee B. Shields

**W**hen a landowner near Rugby, N. Dak., has a question about soil, Al Hamby just reaches into his pocket:

- Not for a coin to dial the computerized soil data bank in another State;
- Not for a trunk key to lift out the published soil survey for the whole county;
- Not for an office key to go look at the 100-pound wall-hanging actual soil profile that helps insulate the building in winter;
- Rather, for a handy pocket-sized, mini-soil profile that he built himself.

**It is accurate:** The innovative Soil Conservation Service soil conservation technician has constructed it of bits of dried soil taken from that farm, or one with similar soils, while the soil survey was underway. It shows the relative depth of each layer as well as color and a hint of texture.

**It is educational:** It doesn't replace the soil survey or the data behind it, but it does help explain those facts and relates them directly to a landowner's property . . . and it's a lot easier than carrying around a 6-foot-long actual "slice" taken from a soil pit (and easier than digging another pit, especially in one of North Dakota's long winters!).

**It is motivational:** Using the pocket soil profile, and often giving it to the landowner after the discussion, Al Hamby has good success in helping the landowner understand alternative ways of protecting and improving natural resources, and then helping the landowner put soil and water conservation on the land. The landowner benefits; so does the community, at the geographic center of North America . . . so do North Dakota and the Nation.

**It is easy to make:** The mini-soil profile is nothing more than a 2- by

6-inch piece of scrap fiberboard on which Al glues bits of soil and sometimes mini-blades of grass or crop stubble to show the typical soil cover. He can make one in as little as 15 minutes.

He begins with boxes of soil samples that SCS soil scientists have collected in the field (to aid during the winter in writing detailed descriptions for published soil surveys about what was found at various depths).

With the tap of a hammer, Al grinds up a little soil from each layer and puts it into a separate nut cup or coffee cup. (He says it takes practice to know how much to grind . . . and lime won't stand any grinding.)

He holds the fiberboard (white is best) on the table with strips of masking tape on which he has marked lines for the scale depth of each layer.

Then he:

1. Spreads white household glue smoothly on the fiberboard, one section at a time.
2. Holds the edge of a 3- by 5-inch card against the line so soil won't spill over onto the next layer.
3. Sprinkles the ground soil on top of the glue, one layer at a time.
4. Saturates each profile with a 4-to-1 mixture of water and glue to seal it.
5. C-a-r-e-f-u-l-l-y removes the masking tape, and then lets the whole thing dry.
6. Fixes any problems or removes excess glue with a razor blade or the all-purpose 3-by-5 card.

The resulting "pocket profile," Hamby says, has unlimited potential for use or display.

When he made his first one about 4 or 5 years ago ("to do something with all those boxes of soil"), he just carried it around to work with cooperators of the Pierce County Soil Con-

servation District that he has been aiding for 32 years. He found it far easier to move and less breakable than a full-size soil profile.

The landowners more than liked the idea—many of them wanted pocket profiles to keep of the soils on their property. SCS people in State and field offices in North Dakota have found them helpful in training new employees and in talking with other agencies and community groups about soil-related questions.

Al started arranging several typical profiles in 8- by 10-inch picture frames (mounted on top of the glass). Office walls are full of them now, and even banks, stores, and fairs want in on the act for displays of several kinds.

The conservation district board bought \$50 worth of materials for Al to make a big wall display of pocket

With soil from the sample boxes (background) in place in the fiberboard, Al Hamby applies a sealer mixture of 4 parts water and 1 part household glue. Nut cups hold more ground soil for the next "pocket profile."





# A Rural Community Is Reborn

by Jim Bilyeu

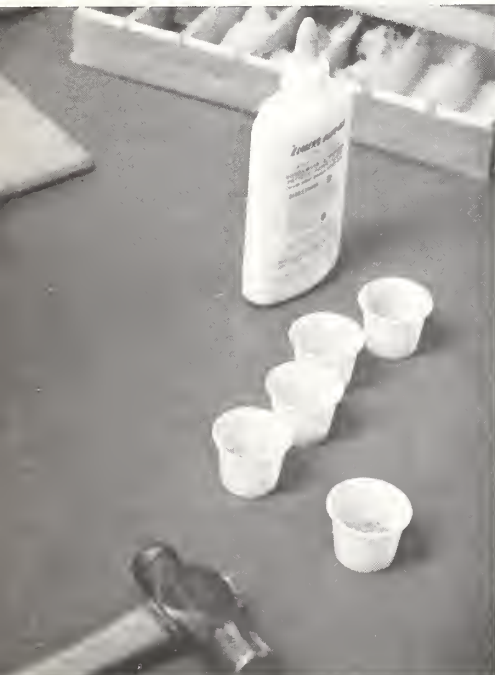
profiles and soil association maps for the county's USDA agricultural service center.

Several teachers also have shown interest in Hamby's pocket soil profiles as a classroom teaching aid (they can be passed around without physical damage to the students or the profiles!).

AI—and other SCS employees he has taught to do the pocket profiles—say they save time in explaining soil and water conservation, help office visitors understand soils much more easily, and “they are more satisfied when they leave.”

Now, if we could just get AI Hamby to fit a Resources Conservation Act summary on a bookmark . . .

**Lee Shields,**  
assistant director, Information Division, SCS,  
Washington, D.C.



**F**or more than 100 years South Guthrie, Tenn., was plagued with flooding. It is in a geologic basin and rain had nowhere to run off. Drinking water was impure, drawn from hand-dug wells.

“It was a common sight to see outdoor privies surrounded by water,” said Clyde Kilgore, a South Guthrie resident. “Health hazards were pretty much a constant threat because we had areas of standing, foul-smelling water and mosquitoes.”

Substandard housing and poor roads were also South Guthrie's lot. The community lacked good education and recreation facilities.

It also lacked opportunity. Over the years many residents—especially the young—despaired and moved away.

South Guthrie is a community of about 200 Black residents in the far northeast corner of Montgomery County. Ten years ago most of its 80 homes were in poor condition. Only a dozen had indoor plumbing.

Isabel Ogburn, another resident, recalled the day 10 years ago when he and his neighbors decided to get help.

Ogburn contacted Glenn Gravette, manager of the local Farmers Home Administration (FmHA) office of the U.S. Department of Agriculture, to see what could be done about getting better housing and a water system for the community. Gravette met with Ogburn and 40 of his neighbors and helped them form an improvement association—a legal body that could borrow money from FmHA.

With FmHA's financial help, the association started improving old homes and building new ones. FmHA also loaned the South Guthrie Improvement Association money to install a city water system.

In 1974, Billy Smith of USDA's Soil

Conservation Service, along with other SCS specialists, helped South Guthrie's leaders outline the rest of their community's needs.

Flooding was still a major problem. SCS surveyed the area, designed a system to carry rainwater off, and financed \$72,000 of it. The system required 4,800 feet of channel improvement.

The Montgomery County government financed the land easements and legal work necessary and built culverts for the storm drain system.

Builders installed 224 feet of 60-inch concrete pipe that now carries storm runoff into a stream away from the community.

South Guthrie is a changed place today. In addition to the city water and flood prevention systems, it has 34 new or improved homes. The U.S. Department of Housing and Urban Development spent about \$75,000 to help South Guthrie residents renovate their community center. The center now includes a library stocked with books from a regional library and a classroom for adult education classes offered by the local school system.

Frank G. Merriwether, a South Guthrie resident in his eighties, summed up the feelings of many of his neighbors when he said, “There wasn't anything here before. We were living with frogs and snakes before we got all this work done. I'm so proud of what our community has done I just feel like sticking my chest out. We're somebody now.”

**Jim Bilyeu,**  
public information officer, SCS, Nashville, Tenn.



# An Innovative Watershed: Design and Maintenance

by Kelly O'Brien

It wasn't too many years ago that residents of Walnut Ridge, Ark., had to wade through the streets after a big rain. And local farmers had to replant or suffer losses due to flooding.

But that was before the Ozark Foothills Resource Conservation and Development (RC&D) flood control-land drainage measure was completed in the Fry-Kellow watershed, recalls Wright Hatcher, district conservationist with the Soil Conservation Service. (The urban-rural project was begun in 1970 and completed in 1973.)

What makes the Fry-Kellow project outstanding is that it is designed for easy and efficient maintenance. The spoil banks are wide enough for a truck to travel on, making it easy for spray equipment to drive beside the ditches.

Access roads that feed maintenance roads on the spoil banks were built through fields to maximize their use by farmers—helping to keep the roads open.

Drop pipes were used instead of open trenches for several reasons: (1) Trenches limit the use of maintenance roads because they cut all the way through the spoil bank; (2) water running through open trenches carries sediment that fills up the ditches; and (3) trenches reduce the amount of land available for cultivation.

Before the project was completed, Hatcher and the watershed commissioners realized the importance of controlling brush in the drainage ditches. After considering the alternatives, they decided to use ground-applied chemical control. The other brush control choices—no control, manual control, or aerially applied chemical control—had proven either ineffective, expensive, or both.

Brush control is the major part of



Fry-Kellow watershed commissioners determined that a brush management spray program was more efficient and economical than hand cutting to prevent the intrusion of brush and trees that would clog ditches.

the Fry-Kellow maintenance budget and is handled by Southern Spray Co. of Memphis, Tenn.

"The watershed improvement district didn't want to invest in its own spray equipment," says Hatcher. "If it did the work, it would have to maintain the equipment, train operators, and worry about materials and rates. It was cheaper for them this way."

The brush control program began in 1972, 1 year after the RC&D project was completed. Half of the 40 miles of ditches was sprayed that year, half the next. Each section is now treated every other year.

The biggest mistake in brush control management is waiting too long to begin. "Runaway brush and weeds are not only more difficult to control," says Keith Throckmorton of Southern Spray Co., "but also more expensive."

Throckmorton handles the chemical spraying in the Fry-Kellow district. He relies on various materials to control brush in the drainage system. Mainly he uses "Ammate X," a product that has been used on ditchbanks for nearly 30 years to control woody plants and perennial weeds. Spraying is done between June and August when plants are in full leaf.

The ditches in the Fry-Kellow dis-

trict "look almost as good now as they did in 1973," says Throckmorton.

In fact, Hatcher estimates that the ditches won't have to be dredged for about 20 years. "Some drainage systems have to be dredged every couple of years," he notes. "Not because of silting, but to get rid of the 30-foot stuff that's grown up in the channel."

Other nearby watershed improvement districts are constructing new drainage systems based on the Fry-Kellow project. The Big Running Water watershed improvement district in Lawrence County is one example. Thirty miles of the 90-mile drainage system in its small watershed project have already been sprayed, and a 30-mile section will be treated each year.

Under an RC&D measure, Randolph County, Ark.—just north of Lawrence County—is also building its new drainage system along the lines of the Fry-Kellow project.

Thanks to well-planned construction and regular maintenance of the drainage system, heavy rains don't flood the Fry-Kellow area anymore.

Kelly O'Brien,  
marketing communications department,  
E. I. du Pont de Nemours & Co., Wilmington, Del.

# City Succeeds in Water Savings Campaign

by Mary Lou Damoth

In early 1979, the City Council of Albuquerque, N. Mex., voted to raise the city water rates. This resulted because the lawn and garden watering months of March through September were costing the city more money each year for pumping the water out of the ground and for repairing potholes caused by excess water runoff.

Compounding the problem of a long, hot season was the fact that many Albuquerque citizens didn't understand the basic principles governing their soils: (1) Some water is used by the lawn each day, and only this amount needs to be replaced; and (2) soils will hold only a certain amount of water—any excess runs off and is wasted.

The Albuquerque Water Resources Department, the Central Rio Grande Soil and Water Conservation District (SWCD), and the Soil Conservation Service's Albuquerque field office decided to initiate a citywide educational campaign to conserve water during the 1979 summer season.

The campaign consisted of two approaches. The first was the establishment of an odd-even day watering system. The second was based on a plan developed the previous year by SCS for conserving water in the city's parks. In their plan, Richard Farmer, district conservationist, and Randy Buller, soil conservationist, reduced the frequency and amount of watering to what was needed to replace what was used.

The water savings campaign was announced in May by a full-page spread in two daily newspapers. A soil map of Albuquerque and a management plan were displayed, provided by SCS in cooperation with the SWCD and the city's Water Resources Department.

SCS designed the soil map for lawn

watering to guide Albuquerque residents in replacing only the water lost necessary to keep their lawns green. The map is simple and shows the major streets and the Rio Grande. SCS divided the Albuquerque soils into three types and numbered them on the map to help residents identify their own soil type. Accompanying the map are instructions for interpreting the map and following a water conservation plan.

The easy-to-follow watering plan is illustrated by four charts with brief explanations. The first chart tells how many inches of water are used by lawns per day during March through September. The second chart shows the water-holding capacity in inches of the three soils. The third chart gives the net amount of moisture to be replaced on each of the soils, and the fourth chart lists for each soil the number of days to allow between waterings during March through September.

The remaining instructions tell residents how to determine the amount of water to replace by setting out a container, such as a coffee can, during a watering. When the desired level is reached in the container, they simply turn off the water. The instructions also explain, with an example, how to calculate a delay in watering

when it rains by dividing the amount of rainfall by the amount used by the lawn.

Some final lines note that people should use this plan only as a guide, since factors such as construction activities could alter the soils' water-holding capacities. In a situation where more water is required, the frequency should be increased, not the amount.

According to Buller, public response was overwhelming, and both SCS and the Water Resources Department received numerous phone calls from people who were interested in the water savings plan. As a result of the enthusiastic response, the three agencies distributed the map and plan through leaflets in all Albuquerque water bills in July.

At the end of the summer, a 9- to 13-percent savings in water for Albuquerque testified to the success of the two-fold campaign. And this savings occurred in spite of a 5-percent growth in population!

The city of Albuquerque is proud of its water savings campaign and intends to conduct a similar one during the summer watering season of 1980.

Mary Lou Damoth,  
editorial assistant, SCS,  
Albuquerque, N. Mex.

## Administrator Wins "Connie" Award

The National Wildlife Federation has selected Norman A. Berg, Soil Conservation Service Administrator, to receive a prestigious Special Conservation Achievement award for 1979. He was cited for the major role he played in "increasing agency emphasis on wildlife values when developing natural resources projects," and for his many achievements which have resulted in "better land use and wildlife habitat, better water quality, and protection of prime farmlands and wetlands."



# News Briefs

## Erosion Costs More Than Soil

Increased energy costs, higher fertilizer requirements, and lower yields are all costs of allowing erosion to go unchecked. Lower yield averages from depleted soils make up the highest cost of the three, according to a southern Iowa soil depletion study.

The Soil Conservation Service and the Economics, Statistics, and Cooperatives Service of the U.S. Department of Agriculture completed the 2-year study in 1979. It shows that on already depleted soils, a high level of management and increased fertilizer rates would still result in lower yields.

Currently, severely eroded land makes up about 9 percent of the Southern Iowa Conservancy District's 2 million acres of cropland. The study

projects that if erosion is allowed to continue at its present rate, by the year 2020, severely eroded land will make up 40 percent of the cropland. The plow layer on this eroded land is predominantly subsoil material.

SCS State Conservationist William Brune says, "We've got to be looking down the road 50 to 100 years, and ask ourselves if we could stand to have all our topsoil lost on 40 percent of our sloping cropland."

"There are other costs of erosion too, like not being able to sell a worn-out farm easily, loss of tax revenues from wornout land, and increased costs of sediment damage in lakes and streams. The list could go on."

The soil depletion study indicates that the cost of erosion control is greater for farmers than the economic

returns from controlling erosion. This, says Brune, supports the idea that a farmer should not pay all the costs of conservation. He says farmers would be hard pressed to finance the total conservation job and that conservation provides many benefits to the general public.

Adapted from an article in *Wallaces Farmer*, February 24, 1979.

## Iowa Backs Conservation

Iowa farmers in seven counties are receiving \$30 per acre in one-time, lump sum payments for using conservation tillage, or "Iowa Till," on specified acres for 5 years. The Iowa legislature approved \$500,000 for the State Soil Conservation Committee to spend on the demonstration program. The counties are: Benton, Cedar, Clinton, Jackson, Plymouth, Story, and Winneshiek.

Soil conservation district officials have been contracting with landowners and farm operators. Cooperators must have at least 50 percent—55 percent for corn—of their soil in contracted fields covered with residue from the previous crop—about 2,200 pounds for corn and about 1,000 pounds for soybeans.

It is planned that data on the demonstration program's effectiveness in controlling soil erosion and improving water quality will be presented to the general public and the general assembly by 1981.

New State legislation also annually allocates \$500,000 of the Road Use Tax Funds to the Iowa Department of Soil Conservation to use in a cost-share program to control wind erosion damage along Iowa roads. The incentives program will provide funds to farm operators for various practices which will help control wind erosion along roadways.

## Exhibit Goes Underground

Not a cyclone cellar, but the Henry A. Wallace Crop Center is this 60-foot reinforced concrete dome covered with earth. Located on Living History Farms in central Iowa, it houses the "Conscience of Conservation," an exhibit on soil conservation.

The farms were the site of an address on soil stewardship on October 4, 1979, by Pope John Paul II. The

conservation exhibits feature a number of cartoons on conservation by the late J. N. "Ding" Darling, Pulitzer Prize-winning cartoonist for the *Des Moines Register and Tribune*.

An estimated 50,000 people saw the exhibit in 1979. It will continue April through October 1980.

**Lynn Betts,**  
public information officer, SCS, Des Moines, Iowa.





## Nebraska Cutting Roadside Maintenance Costs

Cheyenne County, Nebr., is starting to win a long-standing erosion war and is saving money in the process. The county, in the western part of the State, is an area of sparse trees, harsh winds, little rainfall, severe winters, and abundant roadside erosion.

When the pioneers carved their "prairie highways" out of the sod in this area, they started a roadside erosion problem that their descendants are still fighting. We are finally starting to win the battle with a conservation program of seeding roadsides in the county to native grasses.

"The grass seedings provide several benefits," says F. B. "Tommy" Thompson, former Cheyenne County highway superintendent. "The grass ditches help trap blowing snow and keep the roads passable during the winter months. They also act as buffer strips for blowing soil from nearby fields, and they provide food and cover for wildlife, especially pheasants."

First funding for purchase of program materials came from the Panhandle Resource Conservation

and Development program. The county provided the labor and equipment for the seedings. Later agreements call for SCS to pay for 75 percent of the costs and for the county to pay the remainder. The Nebraska Game and Parks Commission is now also supporting the project by providing grass seed.

"As more miles of roadside are seeded," says Thompson, "we increase our mowing costs in the county, but we decrease our road grader time required for shaping the roadsides. Road graders cost more than three times as much as tractor mowers, and are at least half again as expensive to operate. With only 300 of the 1,400 miles of rural roads in the county seeded, we have already saved more than 3,000 hours of road grader operating time. That savings is the equivalent of 2 years of a road grader's average annual working hours. With roadside seedings, we have been able to combat inflation and erosion."

County commissioners estimate that all the rural roads in the county will be seeded in 8 to 10 years.

**Paul DeArman,**  
district conservationist, SCS, Sydney, Nebr.



Under the Cheyenne County, Nebr., program after roadsides are shaped, road crews spray a mixture of grass seed and straw mulch onto the shoulder. The mulch reduces erosion and gives the grass a chance to sprout.

## Soil Surveys Aid Forest Industry in Management Decisions

Soil surveys help many different users in developing land or assessing crop, woodland, or forage production according to soil properties and capability. A prime user is the forestry industry, as John Mandzak, a forester in Montana with Champion International, Inc., points out: "We use our soil survey just about every day. For example, we use it when we record soil types on our silviculture, planting, and regeneration survey forms and when we interpret soil properties for our forest culture, forest harvesting, and grazing programs."

The forest industry uses soil surveys in at least five different ways:

**1. Planning access road location and design**—Planning logging roads depends in part upon soil characteristics. For example, soils containing coarse fragments are best because they are stable and durable whereas clayey soils lose their strength when wet and are subject to erosion. If a potential problem area cannot be avoided, the soil survey enables the forester to design the roadbed using such methods as flat-ter grades, more drainage, or special structures such as cribbing.

**2. Determining when and where to plant**—The soil survey aids the forester in selecting suitable species for tree planting, and provides a rating of seedling mortality. High tree seedling mortality can be expected on some soils, and this knowledge allows the forester to adjust the number of trees planted as needed. Also, the amount of snow cover sometimes determines when trees can be planted. The soil survey can identify by location which soils will

# Management Tips

Readers are invited to submit "Management Tips" to the editor, *Soil and Water Conservation News*, Soil Conservation Service, P.O. Box 2890, Washington, D.C. 20013.

have a faster melt-off, such as soils located on south slopes.

**3. Planning harvest methods**—For harvesting timber the survey has several functions. It can identify those soils with a higher water table on which trees develop shallow roots and are subject to tree blowdown during high winds. In such cases, clearcutting is usually recommended. The survey also helps the forester select a time schedule for logging operations since some soils can be severely compacted if logging is done when soils are wet.

**4. Selecting logging equipment**—Types of equipment for moving logs to a loading point range from rubber tired to track-type to cable system (the most complicated and expensive). Determining the appropriate type depends upon three factors, which are supplied by the survey: erodibility of the soil, compaction, and steepness of the slope.

**5. Interpreting soil productivity information**—Interpreting productivity information from a soil survey can help a forest company predict timber production potential so it can plan operations accordingly, including designing the type and capacity of the mill. Productivity information also enables the forest industry to determine which soils are the most productive and set priorities on which sites to thin or plant first.

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## Dr. Kellogg Dies

Dr. Charles E. Kellogg died recently. He served as the Nation's top soil scientist for 37 years until his retirement as Soil Conservation Service deputy administrator for soil survey in 1971. He pioneered in soil classification and established the system that is the basis of the National Cooperative Soil Survey today.

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## Group Meetings Sell Conservation

Want to save gasoline and travel time and sell more conservation? Try group meetings. That's what Idaho's Latah Soil Conservation District and the Soil Conservation Service field office in Moscow, Idaho, have done.

When setting up group planning for the Rural Clean Water Program in the Paradise Creek area and the South Fork of the Palouse watershed, we held a series of small group meetings with landowners. As a result, we made three times more contact with them than we could have made on a one-to-one basis.

In another instance, we wanted to meet with farmers to discuss the district's five-point conservation program. This time we used informal neighborhood group meetings to get the job done. Following the "Reputational Method" described in "Identifying community power actors for rural development," by Tait, Johnson, and Bokemeier (*Journal of Soil and Water Conservation*, November–December 1978), we selected "power

actors" (conservation farmers) who are leaders in their communities to host the meetings.

Discussion among participants was outstanding. It resulted not only in developing rapport between SCS and district cooperators, but also gave us a greater understanding of local problems. This led to commitments to apply conservation measures. In this case, 60 percent of the participants at the meetings gave definite commitments and set up appointments for applying Best Management Practices.

Using group meetings, we've covered more territory and saved gasoline, travel expenses, and telephone time.

You might say our work is similar to that of an insurance salesperson: The more initial contact we make, the more "selling" we accomplish.

**Shiraz Vira**,  
district conservationist, SCS, Moscow, Idaho.

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## Districts' Role in Land Use

At the recent annual meeting of the Michigan Association of Conservation Districts, Michigan Department of Agriculture Director, Dean Pridgeon, urged districts to address the issue of land use. He stated, "Because you represent the local governmental unit most interested in and most experienced in dealing wisely with land use, I believe soil conservation districts must provide leadership in developing good land use systems. I believe you must expand your horizons in the areas where you can serve in protecting the land, because if you don't, there are other people who will step

in and take your place. They may be people with little experience and little interest in conserving our irreplaceable soil and water resources. Our present system of tax credit, Act 116, the Farmland and Open Space Preservation Act, may be a useful tool, but we must also find other ways in which farmers can unite, under the direction of local soil conservation districts, to develop land preservation systems. I offer you this challenge for the eighties."

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# CONSERVATION Research Roundup

Contributing editor, Russell Kaniuka, public information officer, SCS, Orono, Maine.

## Better Disk Harrows

Disk harrow blades are due for a needed face lift to solve problems of soil compaction caused by inefficient design.

Studies conducted in the 1930's showed disk blades to be serious compactors of soil, and this problem has intensified with increased use, and often overuse, of tillage by disk harrowing. The present shape of the disk blade causes its back side to compact soil even as its front side tills soil. Adjacent blades are thus forced to work harder in the compacted soil, wasting tractor fuel.

Agricultural Engineer Carl A. Reaves of the National Tillage Machinery Laboratory (NTML), Auburn, Ala, says that existing soil compaction is increased further as the application of more weight is required to force the blades into the already compacted ground. Compaction, therefore, is especially severe in the small area directly under the blades, where the disk pressure may be 180 pounds per square inch.

Although compaction due to disk harrowing does not stop the growth of plant roots, it generally reduces their rate of growth by 50 percent, depending upon the number of trips the harrow makes through the field. Roots of crop plants in an ideal environment normally grow 2 to 3 inches a day.

Furthermore, compacted soil provides insufficient moisture for growth should no rain fall the first week after planting. It is therefore necessary to avoid compaction to minimize plant stress, Dr. Reaves says.

Research, conducted by Dr. Reaves and associates, produced two basic remedies for soil compaction caused by disk harrowing. First, the blade should be redesigned with a

larger radius of curvature, that is, the blade should be flatter. Second, disk harrows should run at an increased angle of approach, 25 to 28 degrees rather than 16 to 18 degrees.

These two steps greatly eliminate pressure on the back side of the disk blade. "A major benefit is a much sharper blade, one that requires less draft to pull and less weight to push down," Dr. Reaves says.

This research opens the possibility of designing totally new disk harrows with fewer blades. Since fewer blades would be at work, less soil compaction and less wear of equipment would result.

Included in this research project are studies of size and shape of disk, size of disk cut, angle of approach, and speed of disking.

NTML is cooperating with private industry in providing information to improve the design of disk harrows that ameliorate soil compaction.

## Manure Lagoons

Removal of settled solids from manure lagoons reduces odor problems, permits a 50-percent reduction in lagoon size, and saves energy when recycling the wastes onto the land.

About 50 percent of the solids in animal manure will settle to the lagoon bottom, however biological degradation continues so that malodorous substances rise to the top, often to the detriment of neighborly relations. Methods of frequent removal of settled manure solids are under study by agricultural engineer Conrad B. Gilbertson of USDA's Science and Education Administration, stationed at the University of Nebraska, Lincoln.

Gilbertson says that mechanical systems (such as a vibrating screen) for settling solids require more labor

and better management than does the hydraulic approach to solids removal. Basically, hydraulic settling systems reduce the velocity of waste water streamflow to less than 1 foot per second so as to settle 40 to 50 percent of the solids within a 15-minute period.

Velocity reduction can be achieved with dams that spread out the streamflow, but dams are not as efficient as pits, Gilbertson says. These pits are designed to stop flow for 15 minutes so that the solids settle. The settled solids are easy to handle and, if spreading at some distance from the lagoon is required, savings in fuel cost can be significant since "water" per load is decreased.

Pits present no problems in removing solids from the lagoon's streamflow; the problem is removing the settled solids from the pit. A workable solution is to install a concrete ramp as an integral part of the pit. Ramps should have a maximum 8-percent slope and be wide enough to accommodate a backloader, Gilbertson says.

Installation of pits to settle solids may permit reduction of lagoon size by 50 percent of original design capacity. There has been no loss of effectiveness nor have any operational problems come up.

Looking toward the future, Gilbertson envisions the development of manure lagoons roofed with a living mat of vegetation. Not only would such lagoons reduce odors, they might also help ease the energy crunch. Summer temperatures in lagoons may be increased with small solar collector designs, and the heat stored under the living roof could be tapped for warming farm buildings and for other uses, Gilbertson suggests.



## Moving?

Send present mailing label and new address including zip code to:

U.S. Department of Agriculture  
Soil Conservation Service  
P.O. Box 2890, Room 0054-S  
Washington, D.C. 20013

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## Meetings

May	3-7	League of Women Voters of the United States, Washington, D.C.
	11-14	National Council of State Garden Clubs, Inc., Oklahoma City, Okla.
	21-23	Southern Forestry Conference, Biloxi, Miss.
	22-27	American Geophysical Union, Toronto, Ontario, Canada
June	1-4	American Institute of Architects, Cincinnati, Ohio
	2-6	General Federation of Women's Clubs, St. Louis, Mo.
	8-14	World Congress, International Federation of Park and Recreation Administration, Berlin, West Germany
	13-14	Rural Conservation: Protecting Our Farms and Villages, National Association of Conservation Districts and the National Trust for Historic Preservation, Washington, D.C.
	15-18	American Society of Agricultural Engineers, San Antonio, Tex.
	15-20	American Water Works Association, Atlanta, Ga.
	22-27	Air Pollution Control Association, Montreal, Quebec, Canada
	22-26	American Seed Trade Association, Inc., San Diego, Calif.
	23-25	Land Use Issues in Non-Metropolitan America, Association of American Geographers, College Park, Md.
	29-July 3	National Association of Counties, Las Vegas, Nev.
July	12-16	American Association of Nurserymen, Inc., Kansas City, Mo.
	13-26	XIV International Society of Photogrammetry Congress, Hamburg, Germany
	14	Future of American Agriculture as a Strategic Resource, The Conservation Foundation, Washington, D.C.
	26-31	National Environmental Health Association, Milwaukee, Wis.
	27-30	American Agricultural Economics Association, Urbana, Ill.
	29-August 1	Society for Range Management, Las Cruces, N. Mex.

## New Publications

### Creative Land Development by Robert A. Lemire

This is a clear, concise, practical, how-to manual on land use planning in the vicinity of urban areas. It is useful to all concerned citizens and public officials involved in the conflict between population growth and finite resource land—in the struggle to build better communities.

A "pioneer of sensible land use," Lemire shows how a town or municipality can best evaluate

the future resource value of its lands and anticipate pressures for their development. The author has had practical and successful experience not only in Lincoln, Mass., where he lives, but in various parts of the country where he has acted as consultant.

Published by the Houghton Mifflin Company, Boston, Mass. 1979. \$8.95 hardback.

### Chemical Equilibria in Soils by Willard L. Lindsay

The objective of this book is to help bridge the gap between soil science and chemistry and to show that most reactions taking place in soils can be understood and predicted from basic chemi-

cal relationships. Emphasis is placed on minerals and solid phases in soils that dissolve and precipitate and, in doing so, control the composition of the soil solution.

The book is designed for students who have had at least 1 year of inorganic chemistry, and the text is intended for soil scientists, plant nutritionists, aquatic chemists, geochemists, sanitary and water engineers, environmentalists, and others concerned with the reactions, solubility relationships, and fate of chemical substances in soil.

Published by John Wiley & Sons, New York, N.Y. 1979. \$25 hardback.

### Recent Soil Surveys Published

by the Soil Conservation Service

**California:** San Bernardino County, Southwestern Part.

**Iowa:** Cedar County.

**Kansas:** Dickinson County.

**Michigan:** Bay County.

**North Dakota:** Benson County Area.

**Ohio:** Butler County and Logan County.

**South Carolina:** Beaufort and Jasper Counties and Berkeley County.

**Texas:** Henderson County and Schleicher County.